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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,059	11/16/2001	Tiangong Liu	79569-2/jlo	7859

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EXAMINER	
CHASE, SHELLY A	
ART UNIT	**PAPER NUMBER**
2133	4

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,059	LIU ET AL.	
	Examiner	Art Unit	
	Shelly A Chase	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 to 18 are presented for examination.

Claim Objections

2. Claim 10 is objected to because of the following informalities: the claim as written impedes a clear understanding of the claim limitation.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **1** to **8** and **11** to **15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikkelsen et al. (*40Gbit/s all-optical wavelength converter and RZ to NRZ format adapter realised by monolithic integrated active Michelson interferometer,* Elect. Letters) in view of Jae Lee et al. (*Polarisation-independnet, stable, all-optical clock recovery using an SOA/grating filter wavelength converter*, Elect. Letters).

Claims **1** and **11**:

Mikkelsen substantially teaches measuring the bit error rate (BER) for 40Gbit/s wavelength wherein a gain switch receives a 10-20Ghz DFB laser signal (pulse source") and passes the received pulse to an optical multiplexer for multiplexing the received pulse (see pg. 133). Mikkelsen also teaches an integrated Michelson interferometer receiving an injected pulse (see pg. 133, par. 2).

Mikkelsen does not specifically teach that the multiplexer multiplexes the pulse source and at least one test pattern; however, Jae Lee in an analogous art teaches a pulse source train that is multiplexed by an optical multiplexer wherein the pulse train comprises short pulses and data from a pattern generator (see pg. 1369 par. 3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the DFB laser signal of Mikkelsen to include a pulse source that comprises short pulses and pulse patterns from a pattern generator as taught by Jae Lee. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a method for achieving better bit error rate and polarisation independent in optical communications, as Jae Lee points out that utilizing a pulse data and generated pattern pulse is not limited to polarization (see pg. 1369, conclusion).

As for claims **2** and **12**, Mikkelsen teaches the demultiplexer receives the converted signal (see pg. 133, par. 4).

As per claims **3** to **5**, and **13** to **15** Mikkelsen teaches an optical converter converting a return to zero (RZ) signal to a non-return to zero (NRZ) signal with a simultaneous wavelength (see pg. 133 par.1), wherein the signal is generated by optical

multiplexing (see pg. 133 part. 4) and the pulse pattern conversion may be for a positive or negative slope (see pg. 134), interpreted as the same data rate. Mikkelsen also teaches that the converted and demultiplexed signal is converted from a NRZ to a RZ (see pg. 134 par. 3 and fig. 4)

As per claims **6** to **8**, Mikkelsen does not specifically teach the converter includes an amplifier, a filter and a continuous wave source; however, Jae Lee teaches that the wavelength converter (WC) includes a semiconductor optical amplifier (SOA) converting an optical RZ signal, a bandwidth grating filter (OBF) changing the wavelength of the signal and a continuous wave source [T-LD] propagating the wave source (see pg. 1369). Jae Lee also teaches WC includes other elements for converting the optical and electrical signals (see fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the converter of Mikkelsen to include amplifier, filter and continuous wave source as taught by Jae Lee since Jae Lee teaches the advantages of using a converter including amplifiers, filters and continuous wave source. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a converter in optical communication for achieving polarization independence.

5. Claims **16** to **17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikkelsen et al. in view of Jae Lee et al., further in view of Kikuchi et al. (USP 6469823 B2).

As per claims **16** and **17**, Mikkelsen in view of Jae Lee teaches a wavelength converter converting an optical RZ signal to a NRZ and the conversion includes converting optical and electrical signals (see pg. 1369 par. 2 and fig. 1); however, Mikkelsen in view of Jae Lee fail to clearly illustrate converting the optical RZ signal into an electrical RZ signal, converting the electrical RZ signal into an electrical NRZ signal and converting the electrical NRZ signal into an optical NRZ signal.

Kikuchi in an analogous art teaches an optical wavelength converter including an optical to electrical converting unit for converting the optical signal into an electrical signal and an electrical to optical converting unit for converting the electrical signal into an optical signal (see col. 6, lines 10 et seq.). Kikuchi also teaches the wavelength converter converts RZ signals input or NRZ signals input (see col. 5, lines 57 to 61).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the wavelength converter of Mikkelsen in view of Jae Lee to include converting optical to electrical conversions and electrical to optical conversions as taught by Kikuchi. This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a converter for efficiently meeting the requirement of various transmission code and rates in optical communications as taught by Kikuchi (see col. 9, lines 8 to 20).

6. Claims **9** to **10** and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jae Lee et al. in view of Kikuchi et al..

Claims **9** and **18**:

Jae Lee substantially teaches the claimed invention. Jae Lee teaches an optical clock recovery scheme wherein BER is measured by a BER tester, the scheme comprising: an optical fibre multiplexer receiving a laser pulse from a semiconductor laser ("pulse source") and a pattern from a pulse generator, wherein the received data is multiplexed and modulated by an $LiNbO_3$ electro-optic modulator (see pg. 1369 par. 3). Jae Lee also teaches that a 10Gbit/s RZ data generation is generated from a short pulse source and a pulse pattern form a pulse generator (see pg. 1369 par. 3). Jae Lee further teaches a converter converting the RZ signal to an NRZ signal for a respective frequency (see pg. 1639 par. 4).

However, Jae Lee does not specifically teach an optical demultiplexer, a first optical converter and a second optical converter. Kikuchi in an analogous art teaches a demultiplexer [112] for demultiplexing the transmitted optical signal (see fig. 1 and col. 1, lines 47 to 50), a wavelength converter including a first converter [102, 203] converting the wavelength for 1.3 *um* band (first data rage") for a RZ signal and a second converter [104, 204] converting the wavelength for a 1.5 *um* band ("second data rate") RZ or NRZ signal (see fig. 1-2, 6 and col. 5, line 63 et seq.). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the converter of Jae Lee by incorporating a first and second converting unit as taught by Kikuchi since, Kikuchi teaches that a converter corresponding to various transmission codes and rates is efficient in optical communications (see col. 9, lines 8 to 20).

This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a converter for efficiently meeting the requirement of various transmission code and rates as taught by Kikuchi. As to the further limitation of the claims, Kikuchi teaches the wavelength converter includes an optical to electrical converting unit and an electrical to optical converting unit for providing conversion for various received signals in an optical communication system.

As per claim **10**, Jae Lee teaches that the wavelength converter (WC) includes a semiconductor optical amplifier (SOA) converting an optical RZ signal, a bandwidth grating filter (OBF) changing the wavelength of the signal and a continuous wave source [T-LD] propagating the wave source (see pg. 1369). Jae Lee also teaches WC includes other elements for converting the optical and electrical signals (see fig. 1). Jae Lee does not specifically teach a second optical converter including amplifiers, filters and continuous wave source; however, Kikuchi in an analogous art teaches an optical wavelength converter including a first optical converting unit [102, 203] and a second optical converting unit [104, 204] similar to the first optical converting unit wherein the wavelength converts optical to electrical signals as well as RZ or NRZ input signals the optical signal into an electrical signal and an electrical to optical converting unit for converting the electrical signal into an optical signal (see fig. 1-2, 6 and col. 5, line 63 et seq.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the wavelength converter of Jae Lee to include a second converter as taught by Kikuchi Kikuchi teaches that a converter

corresponding to various transmission codes and rates is efficient in optical communications (see col. 9, lines 8 to 20). This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a converter for efficiently meeting the requirement of various transmission code and rates as taught by Kikuchi.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelly A Chase whose telephone number is 703-308-7246. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 703-305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shelly A Chase